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AIR FOR[redacted]ISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office, Los Angeles 45, California

REPLY TO
ATTN OF: WDPCR

9 November 1959

SUBJECT: SAMOS Program Progress Report, 31 October 1959

TO: Director
Advanced Research Projects Agency
Washington 25, DC

1. This report covers progress during the month of October 1959 in the SAMOS Program, directed by ARPA Order No. 9 (Project Code No. 2100). Prime contractors are Lockheed Missile and Space Division and Thompson-Ramo-Wooldridge Corporation (data handling equipment). Fiscal year 1959 funding was $105.6 millions; tentative fiscal year 1960 funding is $148.0 millions. A summary list of contractors is given in Tab 3, Section I of the Development Plan.

2. TECHNICAL STATUS

a. Photographic Reconnaissance System (designated "E")

(1) E-1 Thermal Model Payload. Preliminary results of a ten day thermal test indicated successful temperature control of the payload environment within the required tolerances.

(2) E-2 Engineering Model Payload. Development test and modification was completed 16 October. The fundamental design has been essentially checked out. A preliminary check with the payload mounted in the 240 inch collimator indicated that optical alignment was achieved satisfactorily.

(3) Training Program. The second 8-week training program began during October at Eastman Kodak to familiarize LMSD personnel with the testing and operation of airborne and ground based equipment under development.

b. Ferret Reconnaissance System (designated "F")

(1) F-1 Service Test Model No. 2. Payload. Results of high temperature altitude simulator tests to verify the suitability of the external black finish selected for orbital thermal control were satisfactory except for flaking of paint in areas where thermal shock

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was greatest. Investigation of the thermal characteristics of the paint is continuing but the overall thermal design is considered sufficiently satisfactory to preclude the need for any further high altitude temperature simulator testing. Vibration tests of this model during the month also were completed satisfactorily. The payload was mounted both longitudinally and laterally and subjected to random and sine wave frequencies in the 2-3 kc range.

(2) Back-up Power Converter Tests. During life testing under simulated high altitude conditions, the 120-volt and 500-volt power converters failed after 150 and 72 hours respectively. Cause has been attributed to faulty Zener (switching) diodes.

(3) F-2A Prototype Payloads. Component assembly of both these payloads is in progress. Changes to improve the reliability of the band switching units for the band 1 and band 2 receivers have been incorporated in the payload design.

(4) F-2 Ground Data Handling Equipment. Preliminary negotiations were completed for a subcontract with the General Applied Science Laboratory to design and fabricate the data conversion and evaluation equipment for the Development Control Center. A formal contract is being prepared.

(5) F-3 Payload Development. The bandwidth of the video amplifier portion of the logarithmic IF amplifier has been extended successfully to 5 megacycles in breadboard form. Performance tests of this design are being continued to demonstrate stability and uniformity. Design and fabrication of a control panel for the digital tape recorder were completed, and operation of the panel with an Ampex prototype model digital recorder was satisfactory.

(6) A preliminary study of ferret reconnaissance capabilities through the use of a programmed computer gaming procedure has been completed. The results will be used to determine the advanced ferret reconnaissance system (F-4) concept.

3. PROBLEMS ENCOUNTERED

No significant problems have been encountered during this reporting period.

4. WORK SCHEDULES

a. Photographic Reconnaissance System (designated "E")

(1) First E-1 Prototype Payload. Final assembly testing evaluation and modification 75% complete. Delivery set for 23 November. Spare payload to be completed 15 December. Second prototype to be delivered 29 January.

(2) First E-2 Mark I Prototype Payload. Subassembly 30% complete. Component testing to begin 15 November and final assembly 15 January.

(3) E-2 Thermal Model Payload. In final assembly and instrumentation. Environmental testing to begin in November.

(4) Ground Reconstruction Electronics. Installation of first prototype GRE equipment is complete. The second prototype unit will be delivered to Vandenberg AFB on 7 January. The first prototype repeater kinescope has been assembled and is under evaluation and modification.

(5) E-1 Payload Operating Console. Assembly started, delivery to Vandenberg AFB on 8 February.

(6) Primary Record Film Processor. Functional tests completed. Delivery to Vandenberg AFB on 23 November, with installation to begin on 30 November.

b. Ferret Reconnaissance System (designated "F")

(1) F-1 Prototype Payloads (flight and spare). Received at LMSD on 23 October; after completing extensive acceptance tests successfully. Now being subjected to quality assurance tests prior to modification and checkout procedures.

(2) F-1 Ground Data Handling Equipment. Testing progressing on schedule with delivery to LMSD scheduled for 29 January.

(3) F-2A Thermal Mockup Payload. Testing completed.

(4) F-2B Prototype Payloads. Both prototypes 85% fabricated with subassemblies 50% tested. Testing of F-2B Thermal Mockup Payload in the high altitude temperature simulator scheduled for November.

(5) F-2 Ground Data Handling Equipment. Fabrication of the evaluation and command equipment to be installed at Vandenberg AFB and the New Boston Station 60% complete. Delivery scheduled for 3 June.

(6) F-3 Payload. Preliminary design of payload structure completed. Fabrication and assembly of various other components of the first prototype are in process.

c. Support Facilities. Construction is progressing as follows:

(1) Launch Complex No. 1, Point Arguello. The latest official Navy report indicates a beneficial occupancy date (BOD) for launch stand #1 of 30 December and launch stand #2, 31 December. AFBMD estimates completion of launch stand #2 in February, six months behind the original contract date.

(2) Launch Complex No. 36, Patrick AFB. The blockhouse and launch pad are under construction. Final plans and specifications for the propellant loading system and the service tower will be released for advertising of construction in November 1959. BOD for the launch stand is June 1960.

(3) Vandenberg AFB. Construction of the tracking and data acquisition building is progressing on schedule. Design criteria have been completed for the GE MOD III Guidance facility. Design will begin in November. BOD is October 1960.

(4) New Boston. Construction of this tracking and data acquisition station is progressing on schedule with completion planned on an incremental basis from February to September 1960.

(5) Ottumwa, Iowa. Plans and specifications for the technical facilities for this tracking and data acquisition station are complete and ready for contract advertising. Design of support facilities is being initiated. Construction is to begin in December 1959, with completion scheduled for February 1961.

(6) Offutt Air Force Base. Design of the Technical Operations Control and Intelligence Processing Center was initiated in October. The schedule for the interim facility provides for completion of design in December 1959, start of construction in February and completion of construction in June. The schedule for the complete facility provides for completion of design in March, start of construction in May and completion of construction in January 1961.

(7) Development Control Center, Sunnyvale, Calif. Construction of increment one is progressing on schedule toward completion in December. Increment two is being advertised for construction bids, with completion scheduled for June 1960.

5. ARPA ACTION REQUIRED

No ARPA action is required at this time.

Harry L. Evans
for O. J. RITLAND
Maj Gen, USAF
Commander

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